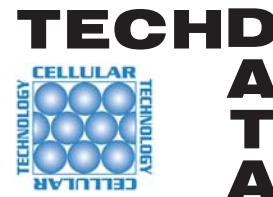




# Submerseal

Watertight Joint Seal for Continuous Immersion



**Submerseal** is a joint-face-adhered, precompressed, primary seal for retrofit and new structural expansion joints and construction joints where continuous or intermittent immersion or contact with chlorinated water (up to 5 ppm), saline water or potable water is planned.

**Submerseal** features EMSEAL's patent-pending microsphere-modified acrylic impregnation infused into the cellular foam base material and is coated with a high-grade silicone coating that has been tested for durability under continuous immersion in chlorinated, saline or potable water.

## Uses

Manufactured to resist degradation from contact with chlorinated water at concentrations typically found in swimming pools, fountains, water parks, etc. including normal and intermittent maintenance "shock" concentrations.

## Product Description

Featuring a convex silicone-bellows sealing surface and backed by an integral, pressure-resisting impregnated foam backing, **Submerseal** provides a lasting solution to joint sealing applications where constant exposure to chlorinated water is expected.

The system is comprised of precompressed, silicone-and-impregnated-foam hybrid installed into field-applied epoxy adhesive on the joint faces with the silicone bellows locked to the joint faces with a field-applied silicone sealant band and corner bead.

## Features

**Watertight** – **Submerseal** is installed with the convex, tensionless silicone bellows facing the liquid ensuring that watertightness is achieved.

**Non-Invasive Anchoring** – there are no hard metal-to-substrate connections with **Submerseal**. This includes embedded pins, anchors, screws, bolts or tracks, trays or rails. The system is locked to the joint faces by the 1) backpressure of the foam; 2) the epoxy adhesive; 3) the field-injected silicone sealant band and corner bead at the joint face to foam-and-silicone bellows interface.

**Applicable Standards:** The silicone coating is compliant to NSF/ANSI Standard 61; NSF Standard 51; FDA Regulation CFR 177.2600; MIL-A-46146; and UL 94 Flame Class, 94 HB.

## Standard Sizes

1/4" (6mm) increments from 1/2" to 4" (12mm to 100mm).

## Movement Capability

+25% and -25% (Total 50%) of nominal material size.

## Color

Submerseal's standard color is "white". Custom colors are possible but color can impact hydrostatic head capability—consult with EMSEAL.

## Head of Water Resistance

For submerged applications this product has been tested in a hydrostatic-head pressure simulator to continuously resist water pressure of various levels without leaking. Reference the following table and/or consult EMSEAL for application specific conditions.

### Submerseal Hydrostatic Head Pressure Resistance

Nominal Material Size at Mean T°	Depth of Seal	Continuous Immersion Max. Allowable Liquid Depth
1 inch (25mm)	2 1/4 inch (55mm)	30 feet (10 meters)
2 inch (50mm)	3 inch (75mm)	20 feet (6 meters)
3 inch (75mm)	3 1/2 inch (90mm)	15 feet (5 meters)
4 inch (100mm)	5 inch (125mm)	10 feet (3 meters)

## Performance

Substrates must be solid, parallel, plumb and free of any contaminants.

### IMPORTANT—Cure Time After Installation:

**Submerseal** cannot resist hydrostatic pressures stated unless a minimum of seven days is allowed for the injected silicone sealant bands and corner beads to fully cure. Cure time can vary based on environmental conditions. It is the responsibility of the installer to monitor cure.

## Composition

- **Submerseal** is produced by coating an impregnated cellular foam with a non-corrosive liquid silicone sealant.
- The external silicone facing is factory applied to the foam at a width greater than the maximum offered extension and is cured before final compression.
- The silicone application and curing takes place in a factory-controlled environment. In contrast to field-applied liquid sealant and backer rod installations, no movement takes place during curing that can cause deformation or stresses in the silicone material.

- When compressed, a convex bellows is created in the coating. As joint movement occurs the bellows simply folds and unfolds virtually free of tensile stress in the silicone material.
- The foam provides a resilient backing to the silicone coating, making the system capable of resisting head pressure.
- **Submerseal** is supplied in 6.56 LF (2m) shrink-wrapped lengths (sticks). Submerseal is precompressed to less than the joint size for easy insertion. After removal from the shrink-wrap and hard board restraining packaging, it expands gradually.

**Table 1: Typical Physical Properties of Submerseal Impregnated Foam**

Property	Value	Test Method
<b>Base Material</b>	Cellular, high density, polyurethane foam	N/A
<b>Impregnation</b>	Proprietary, modified, water-based, acrylic	N/A
<b>Temp. Service Range</b> High Low	185°F (85°C) -40°F (-40°C)	ASTM C711
<b>UV Resistance*</b>	No Changes--2000 hours	ASTM G155-00A
<b>Resistance to Aging*</b>	No Changes--2000 hours	ASTM G155-00A
<b>Bleeding:</b> -40°F to 180°F (-40°C to 85°C)	No bleeding when compressed to minimum of claimed movement, i.e. -25% of nominal size and when simultaneously heated to 185°F (85°C) for 3 hours	
<b>Compression Set</b>	Material recovers to +25% of nominal size within 24 hours after compression to -25% and simultaneous heating to 180°F (85°C) for 3 hours	

(\*Accelerated Weatherometer)

**Table 2: Typical Physical Properties of Silicone Coating**

Property	Value	Test Method
<b>Specific Gravity, 77°F (25°C)</b>	1.33	ASTM D70
<b>Peel Strength</b>	25%	
<b>Hardness (Shore A)</b>	35	ASTM D 2240
<b>Tack-Free</b>	30 minutes	
<b>Elongation</b>	350 %	ASTM D412
<b>Tensile Strength</b>	275 psi	ASTM D412

## Availability and Price

**Submerseal** is available for shipment internationally subject to shipping restrictions for flammable and hazardous materials. Prices are available from local representatives and/or directly from the manufacturer. The product range is continually being updated, and accordingly EMSEAL® reserves the right to modify or withdraw any product without prior notice.

## Installation (Summary)

- Store indoors at room temperature. Expansion is quicker when warm, slower when cold. Substrate temperature must range between 40°F (5°C) and 110°F (43°C).
  - Precautions: Wear chemical-resistant gloves and/or barrier hand cream when handling liquid sealant or epoxy. Remove materials promptly from skin with a commercial hand cleaner before eating or smoking. Avoid inhaling vapors.
  - Sequencing: Install factory-fabricated transition and/or termination pieces first. Connect straight run material to in-place terminations and transitions. Cut closing pieces 3/8-inch (10mm) longer than the opening to be joined. Compress material longitudinally to fit.
  - Ensure nominal material size matches field measured joint size.
  - Mix epoxy and trowel a thin layer onto the joint faces to at least the depth of the Submerseal foam.
  - Remove shrink-wrap packaging and hardboard.
  - Thoroughly wipe and clean the silicone facing using clean lint-free rag made damp with water.
  - Insert material into joint to determined depth below the substrate surface.
  - On the end of the material apply a band of liquid silicone along the pre cured bellows' faces.
  - Join lengths by pushing silicone-coated ends firmly together. Always push, never pull while installing this material. If you stretch the product it will shrink back from the joints resulting in leaks.
  - Before the epoxy or the silicone cures, force the nozzle of the caulking tube between the foam and the substrate and inject a minimum 3/4" (20mm) deep silicone sealant band, measured from the crown of the bellows. Firmly tool the overflow sealant into a defined corner bead between the top of the silicone bellows and the substrate.
  - Clean Up: Remove epoxy or silicone sealant from equipment before it cures using acetone or other solvent\*. Solvents are not effective after the epoxy or silicone has cured. Cured material may be removed by cutting it away with sharp tools or sandpapering.
- \*(Solvents are often toxic and flammable. Observe solvent manufacturer's precautions and refer to Material Safety Data Sheets as well as local and federal requirements for safe handling and use)*
- IMPORTANT:** Allow liquid silicone to attain a complete cure before filling area with liquid (7 days minimum). Note: if the silicone at joints, sealant bands and corner beads is not allowed to fully cure, the system will not be capable of resisting hydrostatic pressure.
- Maintenance: If the silicone bellows or sealant bands are damaged but remain intact, cut out the damaged area and recaulk. No primer is required. If the bond has been affected or the foam backing of the Submerseal is compromised, remove the damaged area, clean & prepare the substrates in accordance with instructions and reinstall new material.